

Quantifying Multiple Benefits of Energy Efficiency in Georgia

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Georgia Environmental Facilities Authority:
Division of Energy Resources

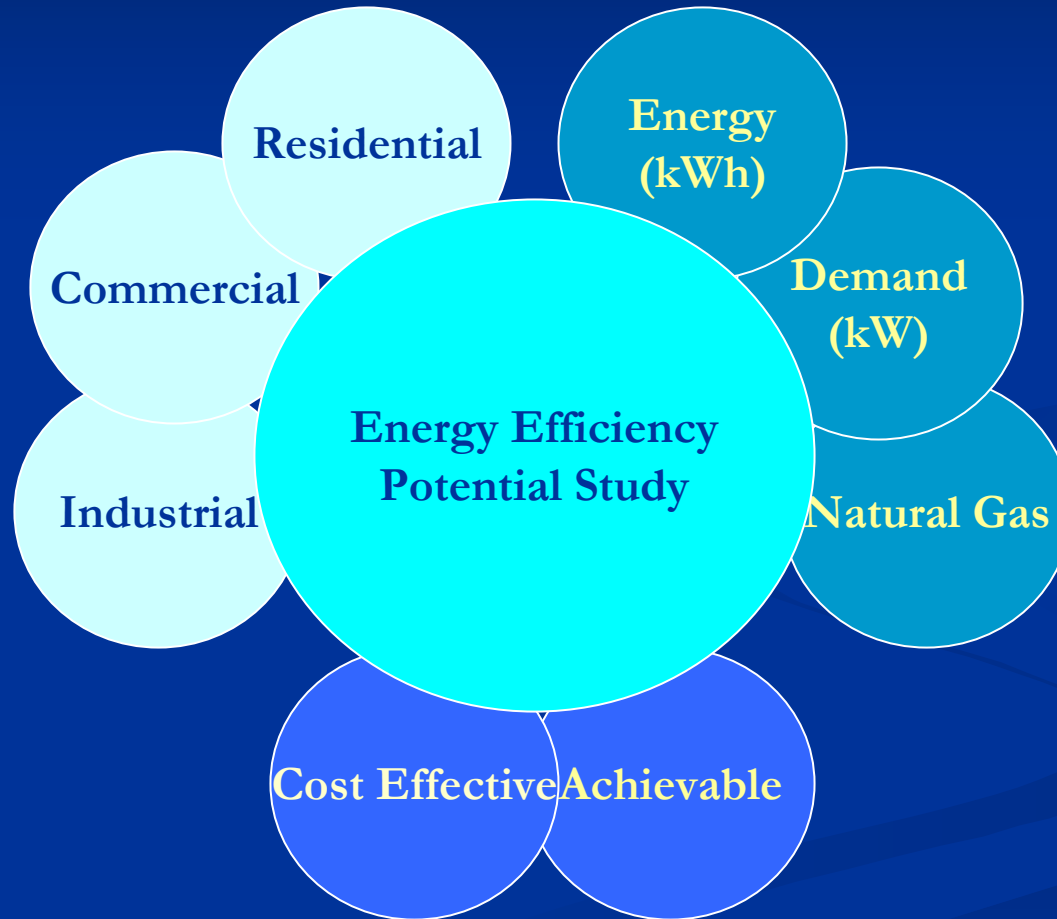
Outline

- Study Overview
- Review of Results & Multiple Benefits
- Policy Implications & Future Directions

Study Background

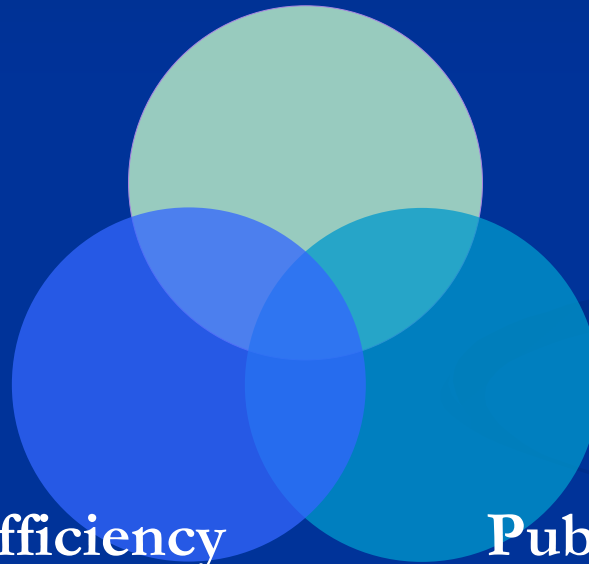
- Capitalize on experience participating in 2004 Integrated Resource Planning process
- Consider energy efficiency potential from 2005 to 2015
- Examine impacts on electricity and natural gas

Study Components



Study Results

Energy Efficiency Potential



Benefits of Energy Efficiency

Public Policy Options

Results: Achievable Energy Efficiency

Load Type	Minimum		Moderate		Aggressive	
Reduction in Sales (MWh)	3,338,924	2.3%	8,704,577	6.0%	12,546,554	8.7%
Reduction in Peak Load (MW)	447	1.7%	1,149	4.4%	1,680	6.1%
Reduction in Gas Sales (MMcf)	7,041	1.8%	16,972	4.4%	21,343	5.5%

Results I: Prices

Results: Potential Impact on Prices

- The Integrated Planning Model was used to estimate changes in wholesale power costs for the “southern region”, i.e., the trading market for Georgia Power
- Estimates of required changes in average \$/kWh and \$/Thm revenues were estimated using the **Lifecycle Revenue Impact**, a variant of the Ratepayer Impact Measure.

Results: Potential Impact on Prices

Changes in Regional Wholesale Price and Local Revenues

Scenario	Wholesale Prices (Southern Region)		Georgia Average Revenue (one-time change)	
	2010	2015	\$/kWh	% of 2005 rate
Min.	-0.4%	-0.5%	\$0.001	0.9%
Mod.	-0.7%	-3.8%	\$0.002	2.5%
Aggr.	-1.8%	-3.9%	\$0.003	3.9%

Results: Potential Impact on Prices

■ Rates vs. Bills

- Since energy efficiency programs reduce units sold and add internal administrative costs, they will have an upward pressure on rates
- Reduced energy use through these programs creates downward pressure on bills
- Several other factors can create downward pressure
 - Program design
 - Effective implementation

Results II: Economy

Results: Cost-Effective Energy Efficiency

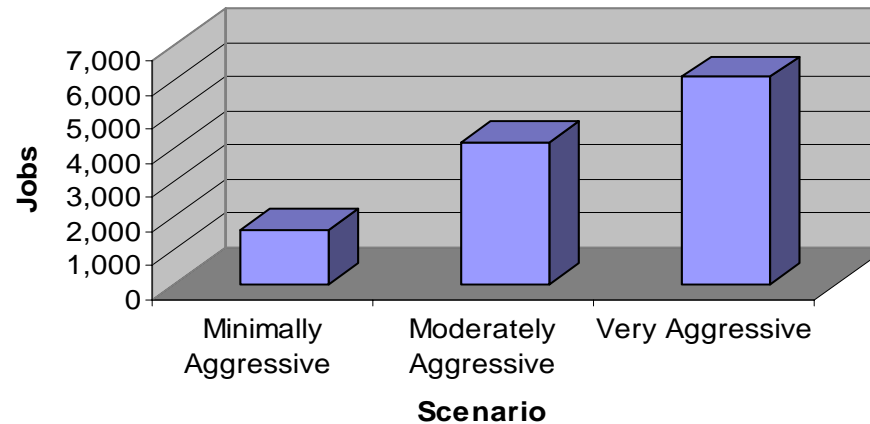
Scenario	Net Benefits (\$ billions)	Benefit-Cost Ratio
Minimally Aggressive	\$0.9	2.2
Moderately Aggressive	\$1.6	1.8
Very Aggressive	\$1.5	1.5

Results: Impact on the Economy

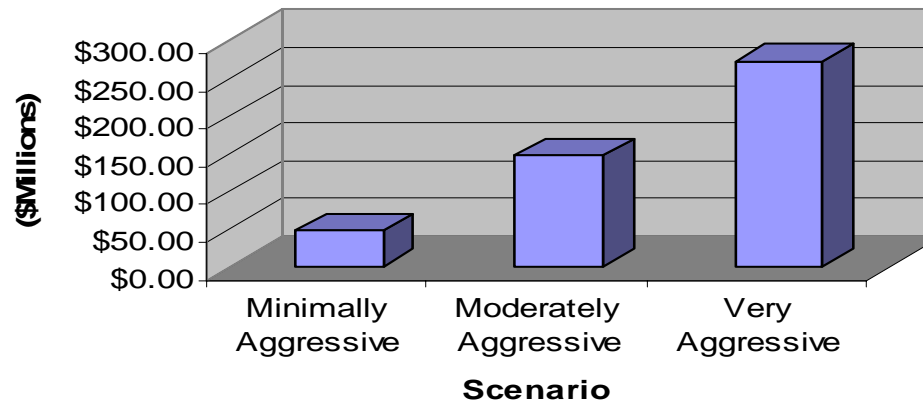
- Investment in energy efficiency generates a net gain for the economy
 - Employment
 - Personal income
- The results are sensitive to assumptions regarding the source of funds for the energy efficiency programs, but jobs increase under all assumptions

Results: Impact on the Economy

Net Change in Employment - 2015



Net Change in Personal Income - 2015



Results III: Power Sector

Results: Impact on Power Sector

- Capturing energy efficiency potential reduces the need for new capacity
- Some of the capacity reductions could come from outside of Georgia

Scenario	Reduction in New Generating Capacity (MW)
Minimally Aggressive	679
Moderately Aggressive	1,410
Very Aggressive	1,425

Results: Impact on Emissions

2010 Generation & Emissions Reductions within Georgia

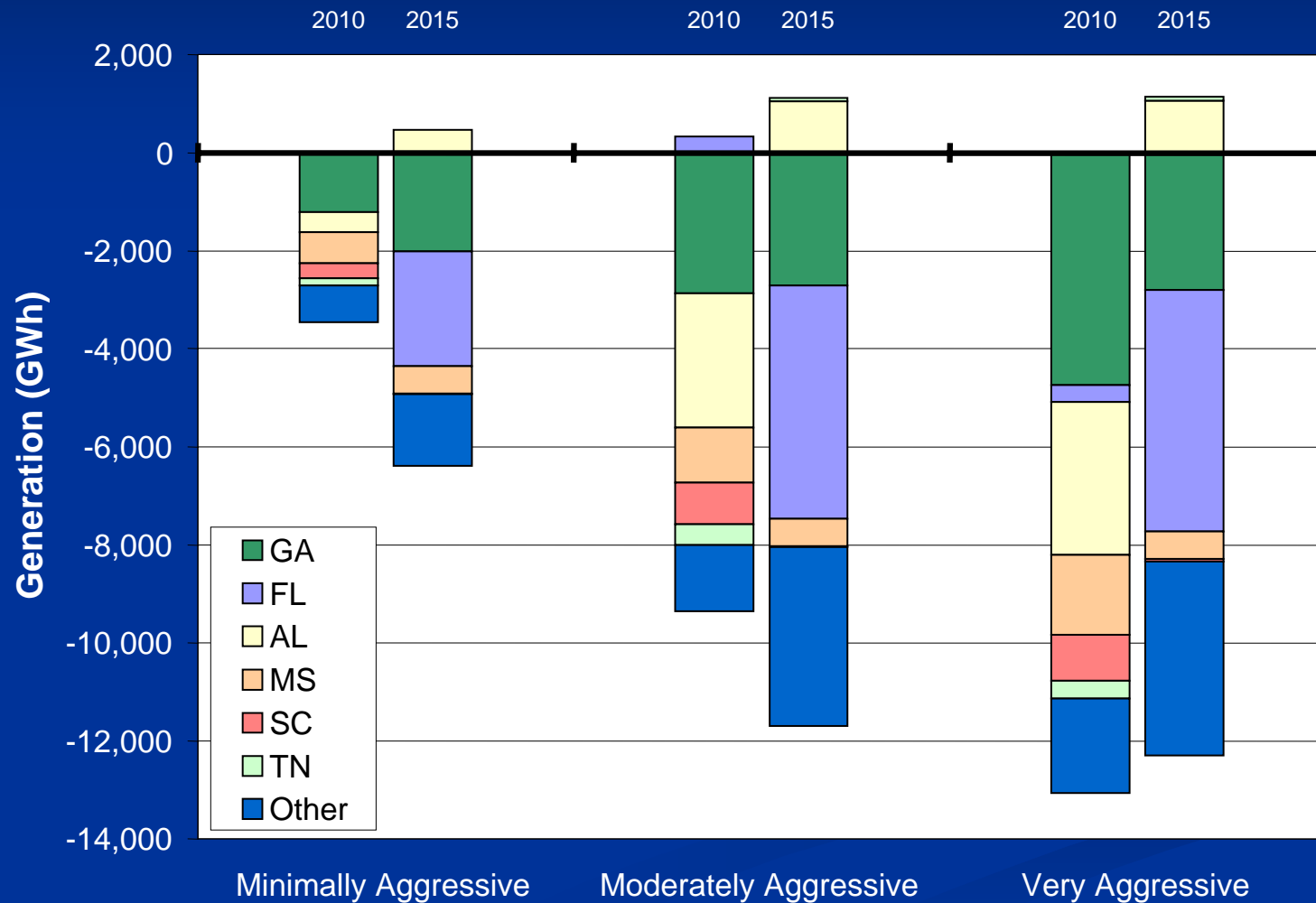
	Generation (GWh)		NO _x (Thousand Tons)		SO ₂ (Thousand Tons)		CO ₂ (Thousand Tons)	
Min.	1,207	0.7%	0.5	0.3%	1.1	0.2%	634	0.6%
Mod.	2,874	1.8%	1.8	1.2%	4.8	0.8%	1,692	1.5%
Max.	4,749	2.9%	2.7	1.9%	7.6	1.3%	2,710	2.4%

Results: Impact on Emissions

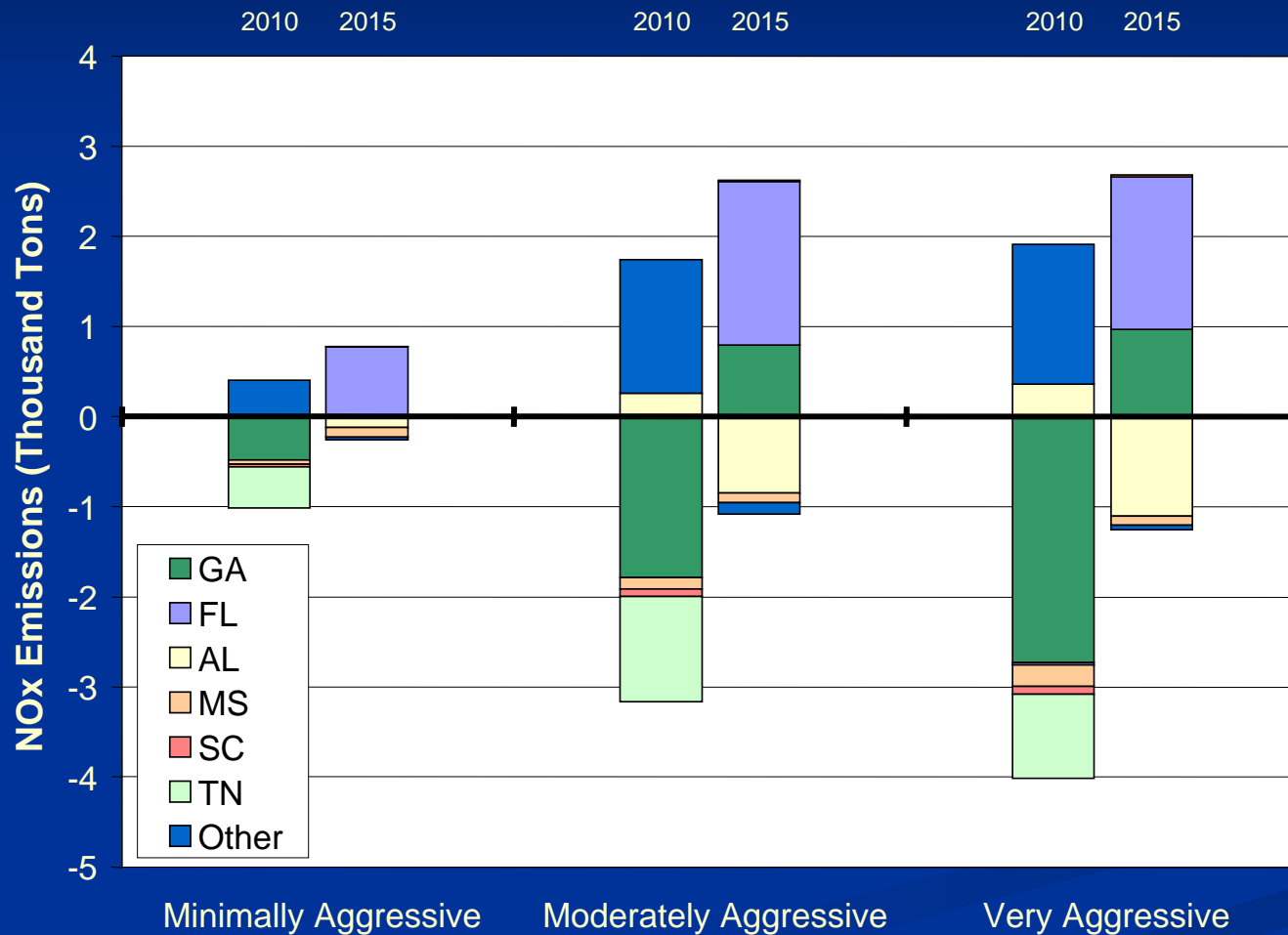
2010 Generation & Emissions Reductions in Southern Region

	Generation (GWh)		NO _x (Thousand Tons)		SO ₂ (Thousand Tons)		CO ₂ (Thousand Tons)	
Min.	1,616	0.6%	0.5	0.2%	2.2	0.2%	805	0.4%
Mod.	5,432	1.9%	2.1	0.7%	6.0	0.6%	2,790	1.3%
Max.	8,707	3.1%	3.2	1.1%	9.5	0.9%	4,510	2.1%

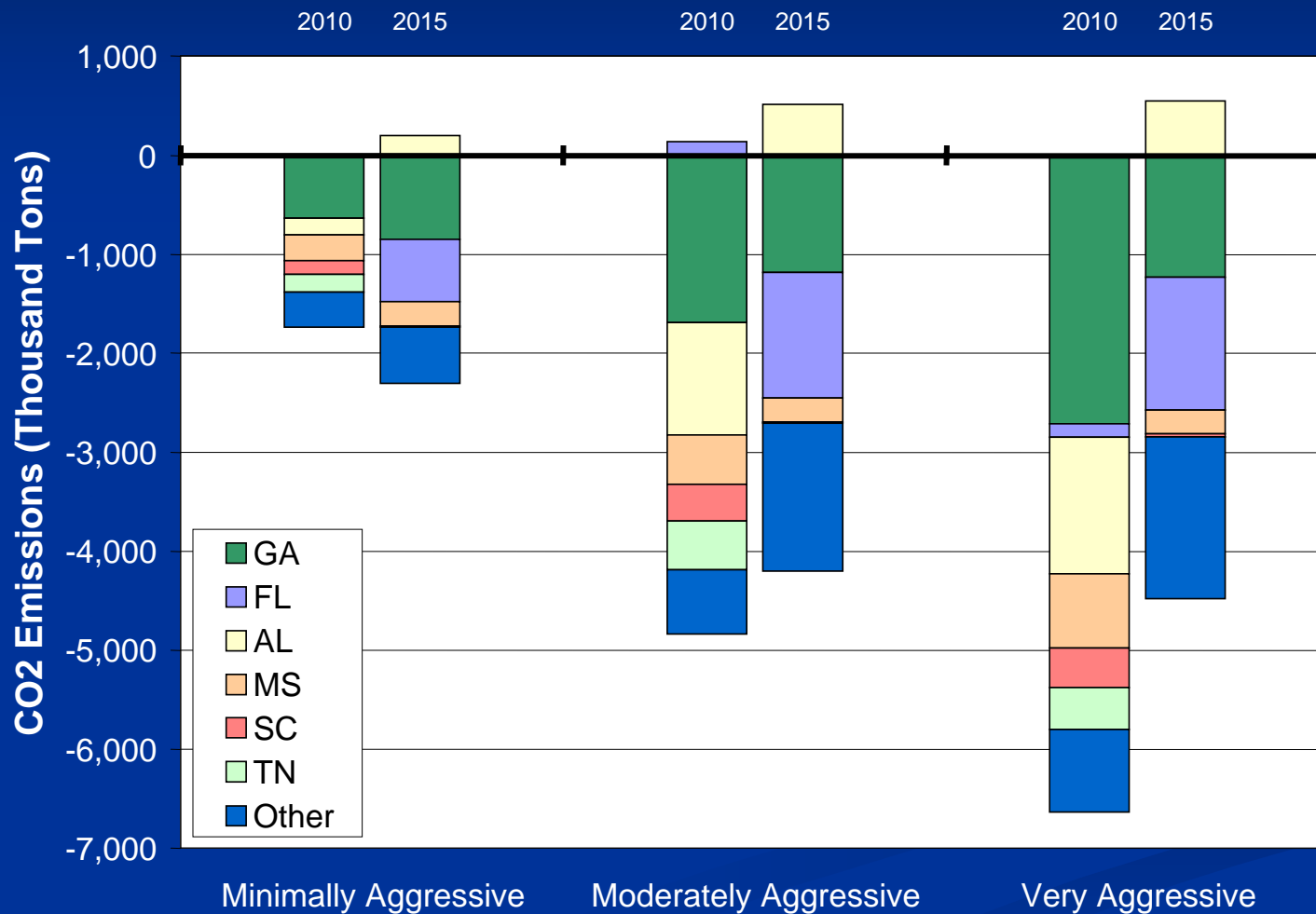
Results: Impact on Emissions



Results: Impact on Emissions



Results: Impact on Emissions



Results: Impact on Emissions

- Demonstrated emissions benefits that result directly from energy efficiency
- Demonstrated regional benefits that result from energy efficiency programs in Georgia

Policy Implications

- Clear and significant benefits foregone if this potential is not captured
- Stakeholders are exploring cost-effective program designs
 - Demand Side Management Working Group
 - Suggested program elements included in Policy Options paper

What's Next?

- Study establishes a foundation for a discussion of energy efficiency initiatives
 - EE as a certified resource in Georgia's Integrated Resource Plan
 - Energy Efficiency Portfolio Standard

What's Next?

- Energy & Environment Initiative
 - Operating under EPA Clean Energy-Environment State Partnership grant to integrate EE in air quality planning
 - Statewide EE/RE inventory and database
 - Integrate EE/RE into SIP
 - Compare “cost” of NO_x reductions achieved with energy efficiency vs. SCR

Need More Information?

Georgia Environmental Facilities Authority

www.gefa.org > Energy Program > Publications

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Thank you!